AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions and listings of claims in the application:

1. (currently amended) An isolated nucleic acid which encodes a phytase having a specific activity of at least about 10 ~~20~~ U/mg protein,

wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM maleic acid-Tris-~~HCl~~, at a pH of about 5.0 ~~7.5~~, about 1 mM $CaCl_2$, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes,

wherein the isolated nucleic acid hybridizes to SEQ. ID. No. 1 under standard conditions ~~either~~ in 6xSSC, 0.6% SDS, 50° C. overnight for Southern blotting ~~or for PCR: 5 mM Mg^{2+}, Taq enzyme, premelting, 94° C. for 2 minutes and 30 cycles of melting at 92° C. for 20 seconds, annealing at 50° C. for 30 seconds and extension at 72° C. for 1 minute~~.

2. (previously presented) The isolated nucleic acid according to claim 1, wherein the nucleic acid is a DNA molecule.

3. (currently amended) A vector comprising:

an isolated DNA molecule which encodes a phytase having a specific activity of at least about 10 ~~20~~ U/mg protein,

wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM maleic acid-Tris-~~HCl~~, at a pH of about 5.0 ~~7.5~~, about 1 mM $CaCl_2$, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes,

wherein the isolated DNA molecule hybridizes to SEQ. ID. No. 1 under standard conditions ~~either~~ in 6xSSC, 0.5% SDS, 50° C. overnight for Southern blotting ~~or for PCR: 5 mM Mg^{2+}, Taq enzyme, premelting, 94° C. for 2 minutes and 30 cycles of melting at 92° C. for 20 seconds, annealing at 50° C. for 30 seconds and extension at 72° C. for 1 minute~~,

wherein the DNA molecule is functionally linked to regulatory sequences capable of expressing a phytase from said DNA sequence.

4. (previously presented) The vector according to claim 3 wherein the, DNA molecule further comprises a leader sequence capable of providing for the secretion of said phytase.

5. (currently amended) ~~A~~ An isolated prokaryotic host cell transformed by a nucleic acid, wherein the nucleic acid is an isolated nucleic acid which encodes a phytase having a specific activity of at least about 10 ~~20~~ U/mg protein,

wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mm maleic acid-Tris-~~HCl~~, at a pH of about 5.0 ~~7.5~~, about 1 mM $CaCl_2$~~2~~, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes,

wherein the isolated nucleic acid hybridizes to SEQ. ID. No. 1 under standard conditions either in 6xSSC, 0.6% SDS, 50° C. overnight for Southern blotting ~~or for PCR: 5 mM Mg^{2++}, Taq enzyme, premelting, 94° C. for 2 minutes and 30 cycles of melting at 92° C. for 20 seconds, annealing at 50° C. for 30 seconds and extension at 72° C. for 1 minute~~.

6. (currently amended) ~~A~~ An isolated prokaryotic host cell according to claim 5, wherein the host cell is selected from the group comprising *E. coli*, *Bacillus* sp., *Lactobacillus* sp. and *Lactococcus* sp.

7. (currently amended) ~~A~~ An isolated eukaryotic host cell ~~or organism~~ transformed by a nucleic acid, wherein the nucleic acid is an isolated nucleic acid which encodes a phytase having a specific activity of at least about 10 ~~20~~ U/mg protein,

wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM maleic acid-Tris-~~HCl~~, at a pH of about 5.0 ~~7.5~~, about 1 mM CaCl2, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes,

wherein the isolated nucleic acid hybridizes to SEQ. ID. No. 1 under standard conditions either in 6xSSC, 0.6% SDS, 50° C. overnight for Southern blotting ~~or for PCR: 5 mM Mg^{2++}, Taq enzyme, premelting, 94° C. for 2 minutes and 30 cycles of melting at 92° C. for 20 seconds, annealing at 50° C. for 30 seconds and extension at 72° C. for 1 minute~~.

8. (currently amended) ~~A~~ An isolated eukaryotic host cell ~~or organism~~ according to claim 7, wherein the host cell is selected from the group comprising *Aspergillus* sp., *Humicola* sp., *Pichia* sp., *Trichoderma* sp. *Saccharomyces* sp. and plants such as soybean, corn and rapeseed.

9. (currently amended) A method for the production of phytase comprising:

transforming a prokaryotic host cell with an isolated nucleic acid, wherein the isolated nucleic acid encodes a phytase having a specific activity of at least about 10 ~~20~~ U/mg protein, wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM maleic acid-Tris-~~HCl~~, at a pH of about 5.0 ~~7.5~~, about 1 mM $CaCl_2$~~2~~, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes, wherein the isolated nucleic acid hybridizes to SEQ. ID. No. 1 under standard conditions ~~either~~ in 6xSSC, 0.6% SDS, 50°C. overnight for Southern blotting ~~or for PCR: 5 mM Mg^{2++}, Taq enzyme, premelting, 94° C. for 2 minutes and 30 cycles of melting at 92° C. for 20 seconds, annealing at 50° C. for 30 seconds and extension at 72° C. for 1 minute~~;

culturing or cultivating the prokaryotic host cell under conditions effective for producing phytase; and

recovering phytase.

10. (currently amended) A method for the ~~production~~ identification of a nucleic acid which encodes a phytase, wherein a probe comprising a nucleic acid of SEQ ID NO. 1 or a fragment thereof ~~which encodes a phytase~~ is hybridized to a sample suspected of containing said nucleic acid which encodes a phytase, under standard hydridization conditions ~~either~~ in 6xSSC, 0.6% SDS, 50° C. overnight or functional equivalents thereof for Southern blotting ~~or for PCR 5 mM Mg^{2++}, Taq enzyme, premelting, 94° C. for 2 minutes and 30 cycles of metlting at 92° C. for 20 seconds, annealing at 50° C. for 30 seconds and extensioin at 72° C. for 1 minute~~,

wherein the nucleic acid which encodes a phytase has a specific activity of at least about 10 ~~20~~ U/mg protein,

wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM maleic acid-Tris-~~HCl~~, at a pH of about 5.0 ~~7.5~~, about 1 mM $CaCl_2$~~2~~, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes, wherein the isolated

nucleic acid hybridizes to SEQ. ID. No. 1 under standard conditions ~~either~~ in 6xSSC, 0.6% SDS, 50° C. overnight for Southern blotting ~~or for PCR: 5 mM Mg^{2++}, Taq enzyme, premelting, 94° C. for 2 minutes and 30 cycles of melting at 92° C. for 20 seconds, annealing at 50° C. for 30 seconds and extension at 72[deg.] C. for 1 minute~~.

11. (currently amended) A method for the production of phytase comprising:

transforming ~~a~~ an isolated eukaryotic host cell with an isolated nucleic acid, wherein the isolated nucleic acid encodes a phytase having a specific activity of at least about 20 U/mg protein, wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM maleic acid-Tris~~-HCl~~, at a pH of about 5.0 ~~7.5~~, about 1 mM $CaCl_2$, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes, wherein the isolated nucleic acid hybridizes to SEQ. ID. No. 1 under standard conditions ~~either~~ in 6xSSC, 0.6% SDS, 50° C. overnight for Southern blotting ~~or for PCR: 5 mM Mg^{2++}, Taq enzyme, premelting, 94° C. for 2 minutes and 30 cycles of melting at 92° C. for 20 seconds, annealing at 50° C. for 30 seconds and extension at 72° C. for 1 minute~~;

culturing or cultivating the eukaryotic host cell under conditions effective for producing phytase; and

recovering phytase.

12. (new) An isolated nucleic acid of claim 1 wherein the nucleic acid encodes a phytase having a specific activity of at least about 20 U/mg protein and wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM Tris-HCl at a pH of about 7.5 1 mM $CaCl_2$, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes.

13. (new) A method for the production of a nucleic acid which encodes a phytase having a specific activity of at least 10 U/mg protein, wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM maleic acid-Tris, at a pH of about 5.0, about 1 mM $CaCl_2$, and about 1.6 mM sodium phytate at about 37° C for about 30 minutes, comprising:

providing two or more oligonucleotide primers which hybridize to SEQ ID NO: 1 or to a complement of SEQ ID NO: 1;

contacting the two or more oligonucleotides with a sample suspected of containing a polynucleotide encoding a phytase; and

amplifying the polynucleotide encoding a phytase using the two or more oligonucleotide primers and the polymerase chain reaction, wherein the polymerase chain reaction is carried out under standard conditions: 5mM Mg^{2++}, Taq enzyme, premelting, 94° C for 2 minutes, and 30 cycles of melting at 92° C for 20 seconds, annealing at 50° C for 30 seconds, and extension at 72° C for 1 minute.

14. (new) A method for the production of a nucleic acid of claim 13 wherein the nucleic acid encodes a phytase having a specific activity of at least 20 U/mg protein, wherein said specific activity is determined by incubating said phytase in a solution containing about 100 mM Tris-HCl at a pH of about 7.5, 1 mM $CaCl_2$, and about 1.6 mM sodium phytate at about 37° C. for about 30 minutes.